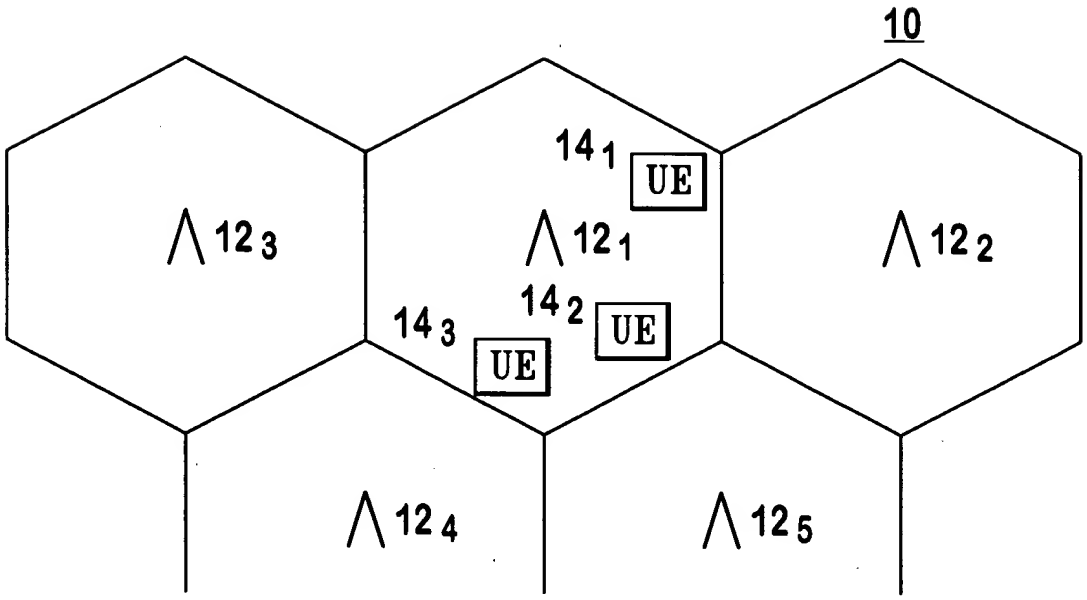
10
14 1
UE
12 3
12 1
12 2
14 2
UE
14 3
UE
12 4
12 5

FIG. 1

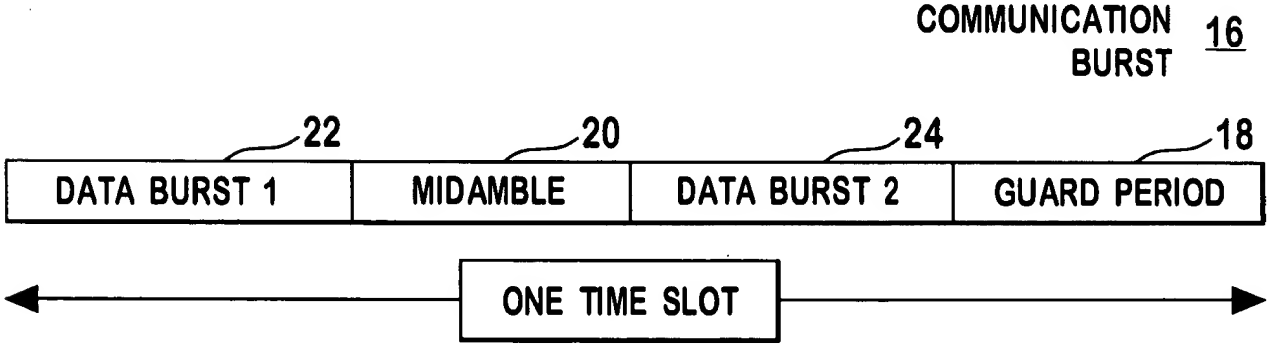
COMMUNICATION BURST 16
22
20
24
18
DATA BURST 1
MIDAMBLE
DATA BURST 2
GUARD PERIOD
ONE TIME SLOT

FIG. 3

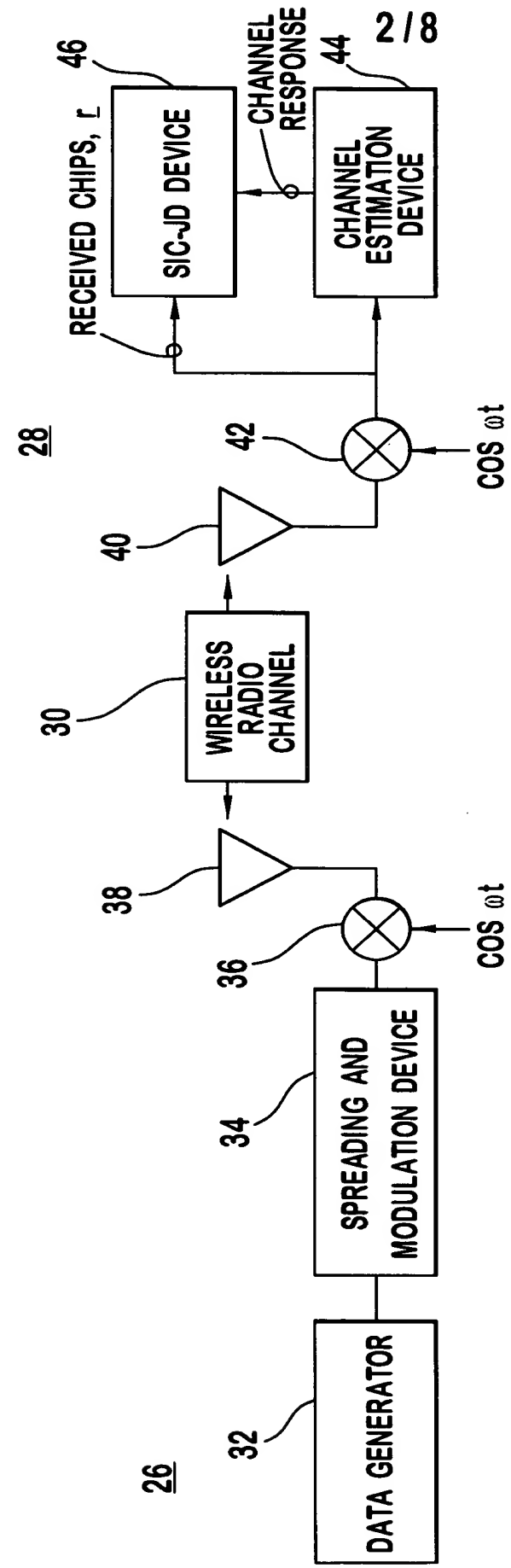
26
DATA GENERATOR
32
SPREADING AND MODULATION DEVICE
34
36
COS ωt
38
WIRELESS RADIO CHANNEL
30
40
28
42
COS ωt
RECEIVED CHIPS, r
46
SIC-JD DEVICE
CHANNEL RESPONSE
44
CHANNEL ESTIMATION DEVICE

FIG. 2

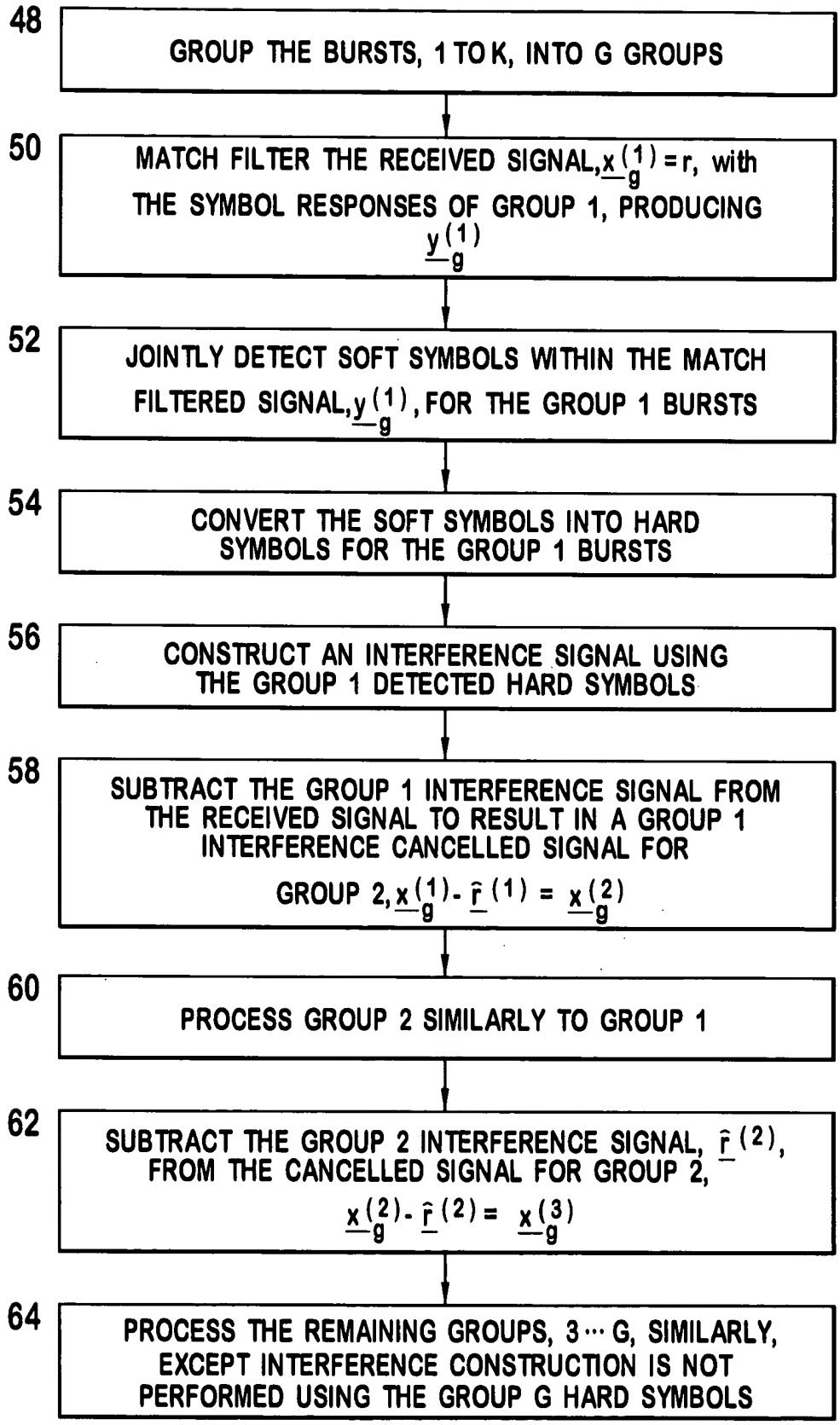
48
GROUP THE BURSTS, 1 TO K, INTO G GROUPS
50
MATCH FILTER THE RECEIVED SIGNAL, $\underline{x}_g^{(1)} = r$, with THE SYMBOL RESPONSES OF GROUP 1, PRODUCING $\underline{y}_g^{(1)}$
52
JOINTLY DETECT SOFT SYMBOLS WITHIN THE MATCH FILTERED SIGNAL, $\underline{y}_g^{(1)}$, FOR THE GROUP 1 BURSTS
54
CONVERT THE SOFT SYMBOLS INTO HARD SYMBOLS FOR THE GROUP 1 BURSTS
56
CONSTRUCT AN INTERFERENCE SIGNAL USING THE GROUP 1 DETECTED HARD SYMBOLS
58
SUBTRACT THE GROUP 1 INTERFERENCE SIGNAL FROM THE RECEIVED SIGNAL TO RESULT IN A GROUP 1 INTERFERENCE CANCELLED SIGNAL FOR GROUP 2, $\underline{x}_g^{(1)} - \underline{\hat{r}}^{(1)} = \underline{x}_g^{(2)}$
60
PROCESS GROUP 2 SIMILARLY TO GROUP 1
62
SUBTRACT THE GROUP 2 INTERFERENCE SIGNAL, $\underline{\hat{r}}^{(2)}$, FROM THE CANCELLED SIGNAL FOR GROUP 2, $\underline{x}_g^{(2)} - \underline{\hat{r}}^{(2)} = \underline{x}_g^{(3)}$
64
PROCESS THE REMAINING GROUPS, 3 ··· G, SIMILARLY, EXCEPT INTERFERENCE CONSTRUCTION IS NOT PERFORMED USING THE GROUP G HARD SYMBOLS

FIG. 4

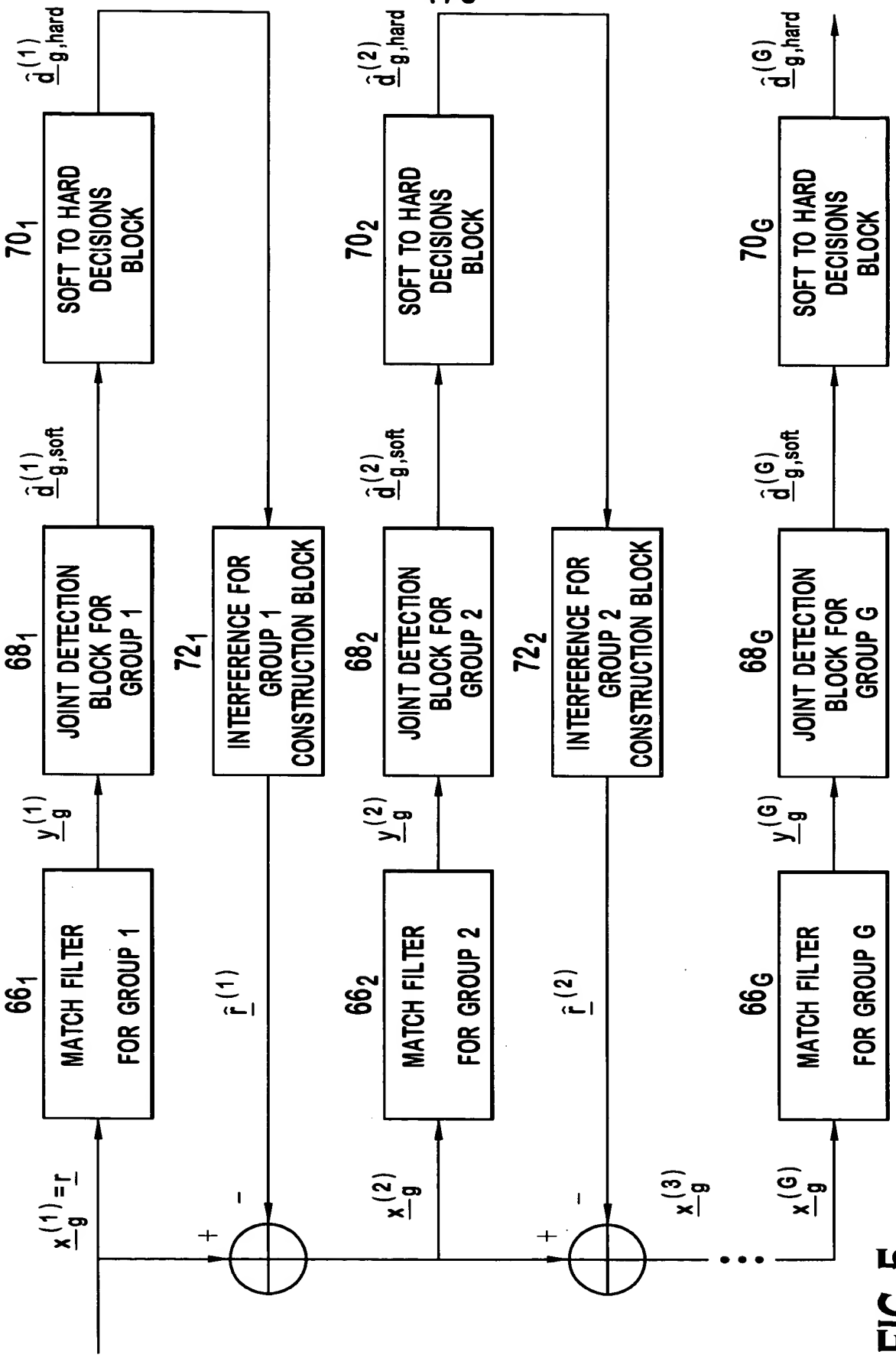
66_1 MATCH FILTER FOR GROUP 1
66_2 MATCH FILTER FOR GROUP 2
66_G MATCH FILTER FOR GROUP G
68_1 JOINT DETECTION BLOCK FOR GROUP 1
68_2 JOINT DETECTION BLOCK FOR GROUP 2
68_G JOINT DETECTION BLOCK FOR GROUP G
70_1 SOFT TO HARD DECISIONS BLOCK
70_2 SOFT TO HARD DECISIONS BLOCK
70_G SOFT TO HARD DECISIONS BLOCK
72_1 INTERFERENCE FOR GROUP 1 CONSTRUCTION BLOCK
72_2 INTERFERENCE FOR GROUP 2 CONSTRUCTION BLOCK
$\underline{x}_g^{(1)} = \underline{r}$
$\underline{y}_g^{(1)}$
$\hat{\underline{d}}_{g,soft}^{(1)}$
$\hat{\underline{d}}_{g,hard}^{(1)}$
$\hat{\underline{r}}^{(1)}$
$\underline{x}_g^{(2)}$
$\underline{y}_g^{(2)}$
$\hat{\underline{d}}_{g,soft}^{(2)}$
$\hat{\underline{d}}_{g,hard}^{(2)}$
$\hat{\underline{r}}^{(2)}$
$\underline{x}_g^{(3)}$
$\underline{x}_g^{(G)}$
$\underline{y}_g^{(G)}$
$\hat{\underline{d}}_{g,soft}^{(G)}$
$\hat{\underline{d}}_{g,hard}^{(G)}$
+
-
+
-

FIG. 5

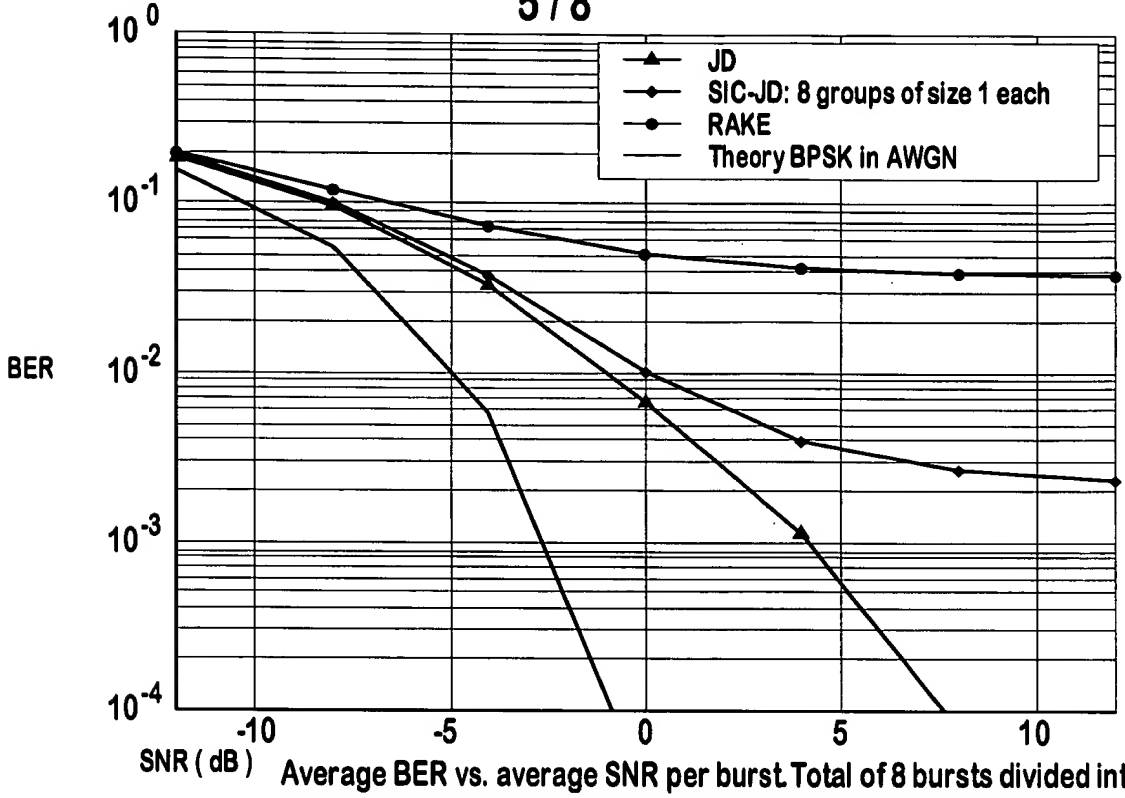

FIG. 6

Average BER vs. average SNR per burst. Total of 8 bursts divided into 8 groups with 1 burst per group. Multi-path profile is of the 3GPP WG4 Case 2 type. All 8 bursts have the same average SNR but pass through uncorrelated channel.

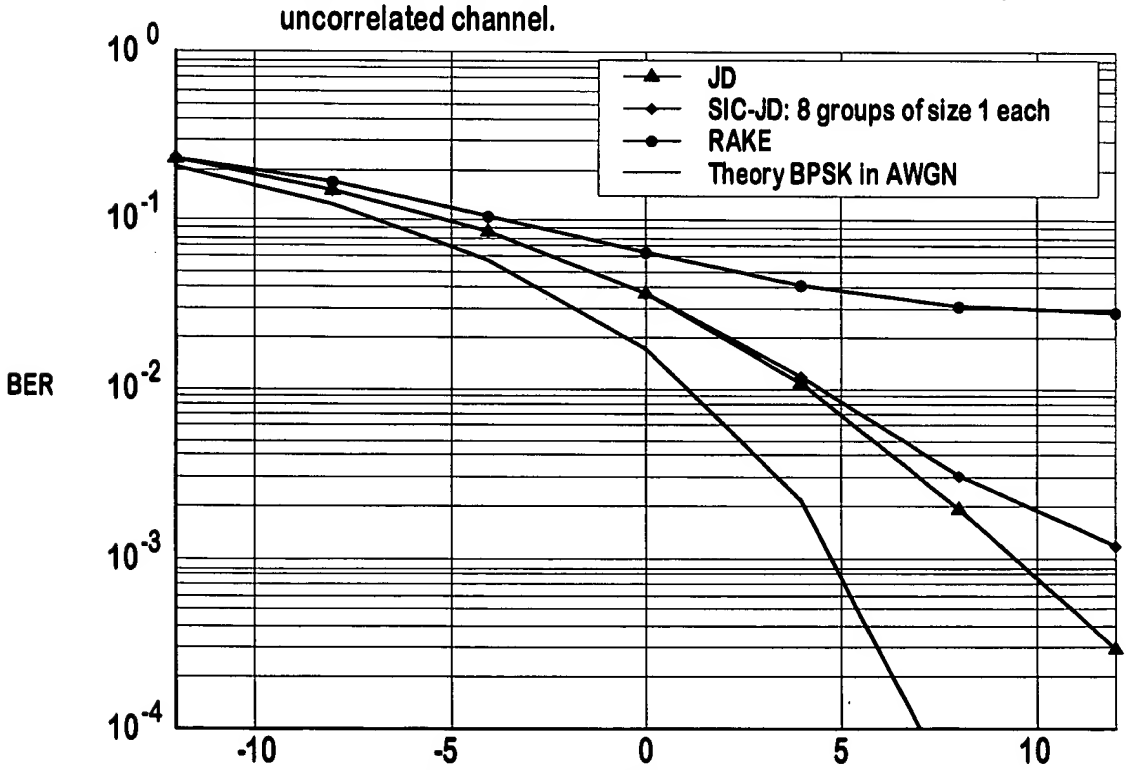

FIG. 7

Average BER vs. average SNR per burst. Total of 8 bursts divided into 8 groups with 1 burst per group. Multi-path profile is of the 3GPP WG4 Case 2 type. All 8 bursts pass through a common channel but their average SNR is separated by 2 dB.

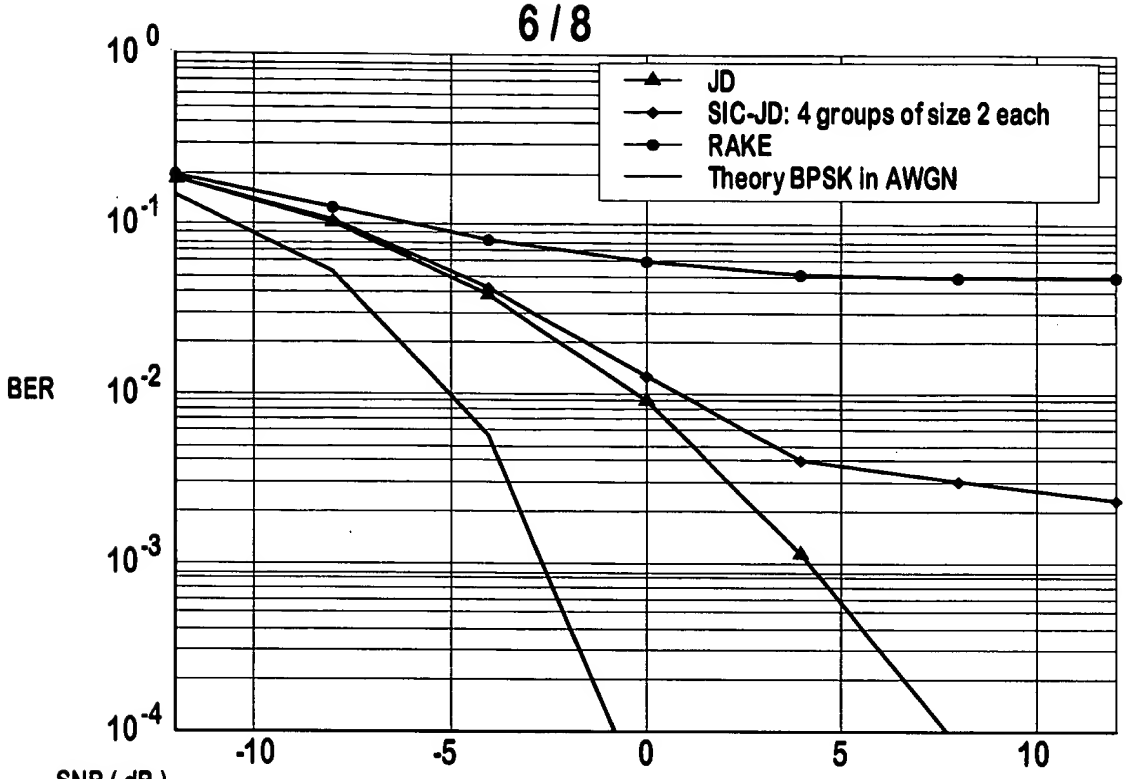

FIG. 8 Average BER vs. average SNR per burst. Total of 8 bursts divided into 4 groups with 2 bursts per group. All bursts in the same group are subjected to the same channel. All 4 groups have the same average SNR but pass through uncorrelated channels with multi-path profile of type ITU Vehicular A.

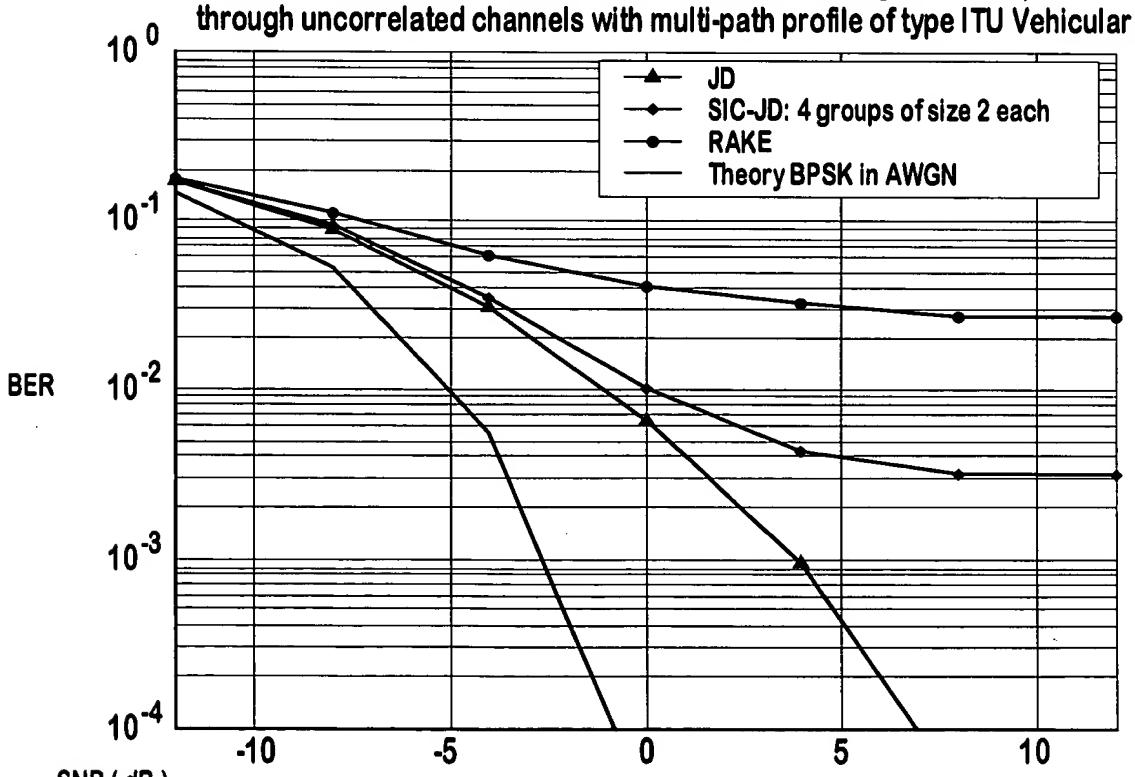

FIG. 9 Average BER vs. average SNR per burst. Total of 8 bursts divided into 4 groups with 2 bursts per group. All bursts in the same group are subjected to the same channel. All 4 groups have the same average SNR but pass through uncorrelated channels with multi-path profile of type 3GPP WG4 Case 2.

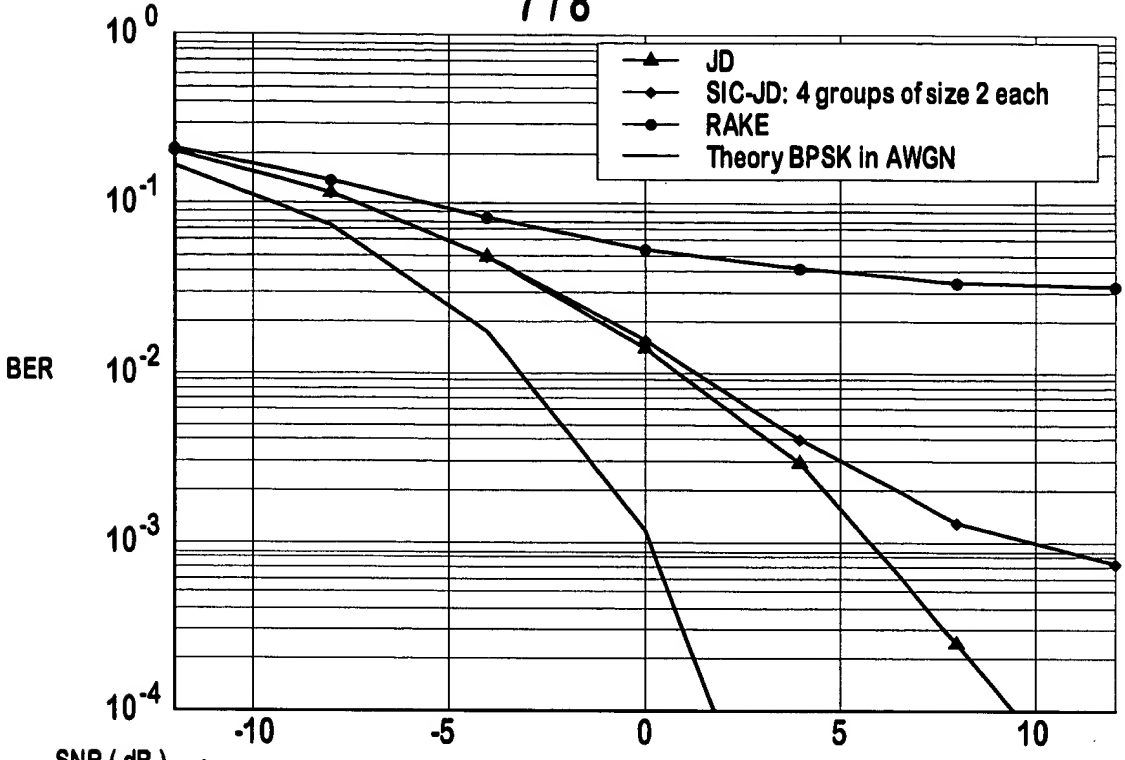

FIG. 10 Average BER vs. average SNR per burst. Total of 8 bursts divided into 4 groups with 2 bursts per group. All bursts in the same group are subjected to the same channel. All 4 groups pass through a common channel but their average SNR is seperated by 2 dB. Multi-path profile is of type ITU Vehicular A.

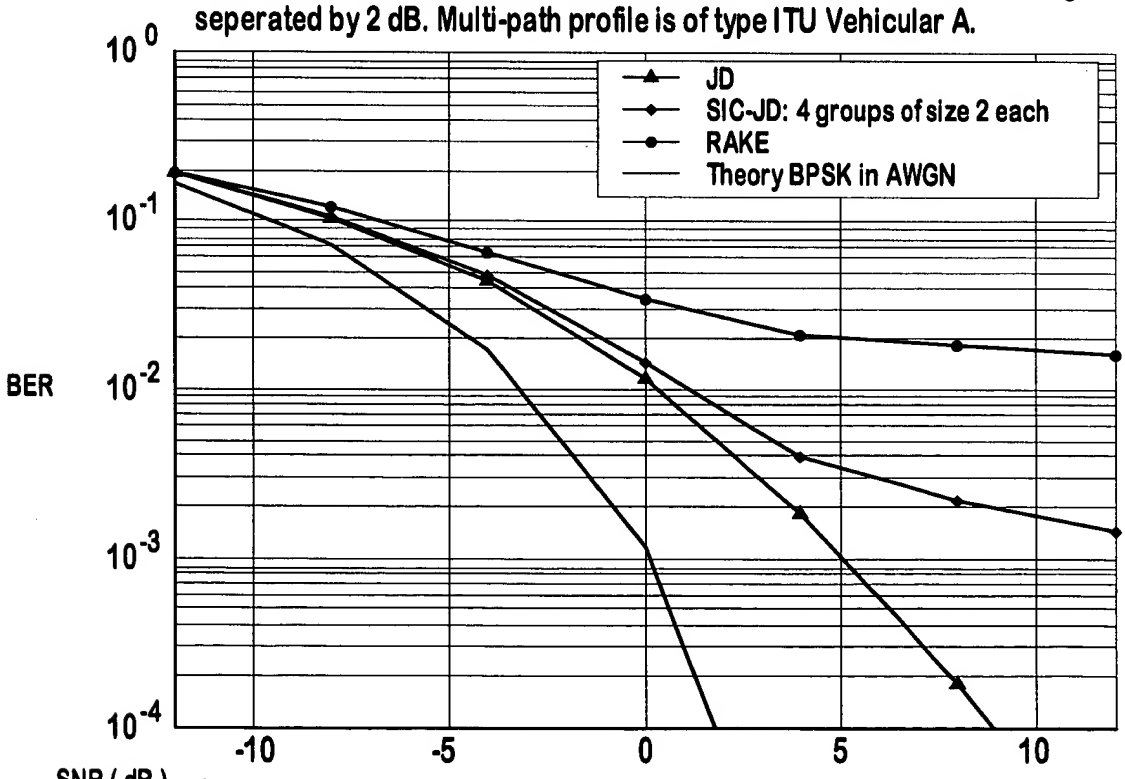

FIG. 11 Average BER vs. average SNR per burst. Total of 8 bursts divided into 4 groups with 2 bursts per group. All bursts in the same group are subjected to the same channel. All 4 groups pass through a common channel but their average SNR is seperated by 2 dB. Multi-path profile is of type 3GPP WG4 Case 2.

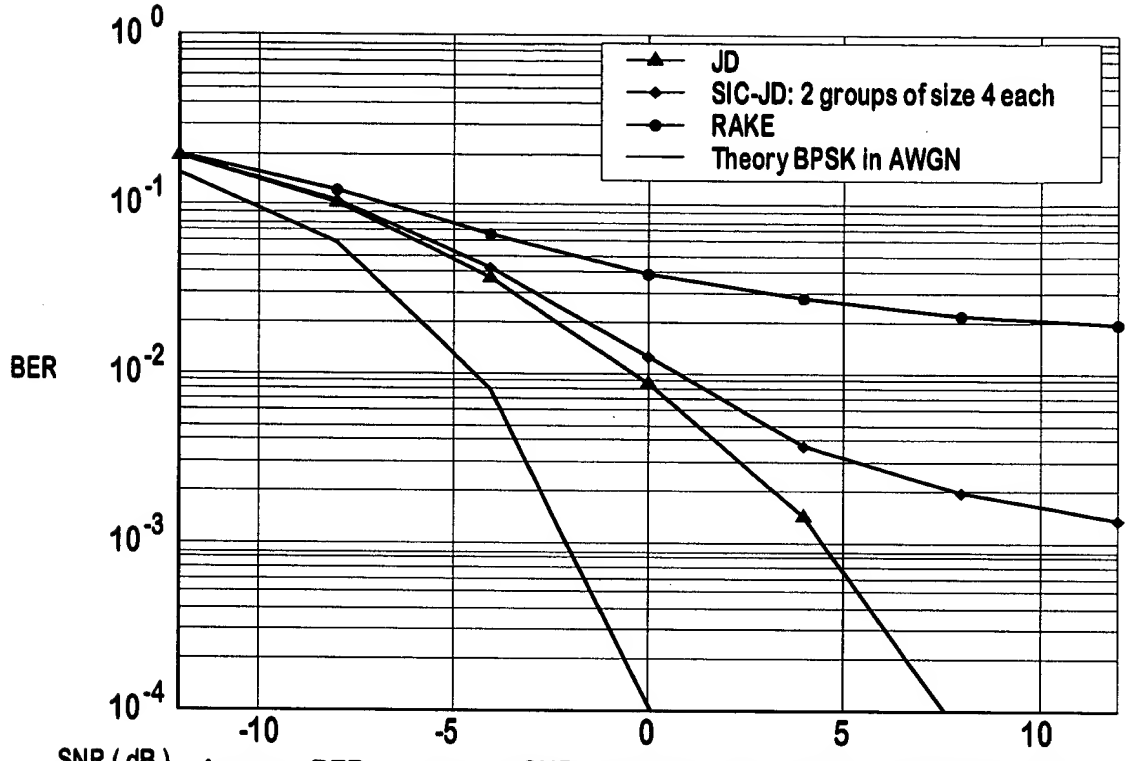

FIG. 12

Average BER vs. average SNR per burst. Total of 8 bursts divided into 2 groups with 4 bursts per group. All bursts in the same group are subjected to the same channel. All groups pass through a common channel but their average SNR is seperated by 2 dB. Multi-path profile is of type ITU Vehicular A.